

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1-19. (canceled)

20. (currently amended) Radiation source comprising:

[[ - ]] an anode (2) [[ , ]] i

[[ - ]] a cathode (3, 8) [[ , ]] i

[[ - ]] a discharge space (4) for electrical discharge between the anode (2) and the cathode (3) [[ , ]] i

[[ - ]] a gas inlet pipe (30) for introducing gas into the discharge space (4), the gas inlet pipe (30) being electrically connected to one of the anode (2) ~~or to~~ and the cathode (3, 8) [[ , ]] i

an electrically insulating assembly (34) for the source;

[[ - ]] means (13 to 23) for producing, in the gas provided in the discharge space (4), an electrical discharge which brings about [[ the ]] emission of [[ the ]] electromagnetic radiation towards [[ the ]] outside the discharge space; and [[ , ]]

~~characterised in that the gas inlet pipe (30) is supplied with gas by~~ a gas supply line (43) that has a first portion (44) connected to a fixed potential and a second portion (42) connected to the gas inlet pipe (30) and that comprises,

between the first portion and the second portion, an electrically conductive material, the gas supply line (43) being wound helically against and spaced from the electrically insulating assembly (34), so that ~~which is arranged for forming, between the portion (42) thereof which is connected to the gas inlet pipe (30) and another portion (44) thereof which is connected to a fixed potential, such an electrical impedance that the production of electrical discharges at the inside the gas inlet pipe (30) is inhibited.~~

21. (currently amended) Radiation source according to claim 20, ~~characterised in that~~ wherein the fixed potential and the anode (2) are earthed and the gas inlet pipe (30) is electrically connected to the cathode (3, 8).

22. (currently amended) Radiation source according to ~~either~~ claim 20, ~~characterised in that it further comprises a further comprising a cooling system (45) for cooling the anode (2).~~

23. (currently amended) Radiation source according to claim 21, ~~characterised in that~~ wherein the cooling system (45) has a circulation of cooling fluid in or on the anode (2).

24. (currently amended) Radiation source according to claim 23, ~~characterised in that~~ wherein the cooling fluid comprises water.

25. (currently amended) Radiation source according to claim 23, ~~characterised in that~~ wherein the cooling fluid comprises air.

26. (currently amended) Radiation source according to claim 23, ~~characterised in that~~ wherein the cooling fluid comprises oil.

27-29. (canceled)

30. (currently amended) Radiation source according to claim 20, ~~characterised in that~~ wherein the means (13 to 23) for producing discharge in the discharge space (4) comprise at least one charge storage capacitor (14) which is electrically connected, by means of a first terminal (15), to the cathode (3, 8) and, by means of a second terminal (16), to a first commutation capacitor terminal ([[17]]18) of at least one commutation capacitor (19) which is electrically connected to the anode (2) by means of ~~[[the]]~~ a second commutation capacitor terminal (20) thereof, electrical commutation means being provided between the first and second commutation capacitor terminals (18, 20) of the at least one commutation capacitor (19) and a source of charge voltage being provided between the first and second commutation capacitor terminals (18, 20) of the at least one commutation capacitor (19).

31. (currently amended) Radiation source according to claim 30, ~~characterised in that~~ wherein the electrical

commutation means comprise a switch which is controlled in single-pulse mode.

32. (currently amended) Radiation source according to claim 30, ~~characterised in that~~ wherein the electrical commutation means comprise a switch which is controlled in pulse mode at a repetition frequency less than or equal to 10kHz.

33. (currently amended) Radiation source according to claim 30, ~~characterised in that~~ wherein the source of charge voltage and the electrical commutation means are ~~such~~ arranged so that the at least one charge storage capacitor (14) is charged by the source of charge voltage shortly before the commutation of the electrical commutation means.

34. (currently amended) Radiation source comprising:  
an anode (2);  
a cathode (3, 8);  
a discharge space (4) for electrical discharge between  
the anode (2) and the cathode (3);  
a gas inlet pipe (30) for introducing gas into the  
discharge space (4), the gas inlet pipe (30) being electrically  
connected to one of the anode (2) and the cathode (3, 8);  
means (13 to 23) for producing, in the gas provided in  
the discharge space (4), an electrical discharge which brings  
about emission of radiation towards outside the discharge space;  
and

a gas supply line (43) having a first portion (42) connected to the gas inlet pipe (30) and a second portion (44) that is connected to a fixed potential, the gas supply line (43) forming, between the first portion (42) and the second portion (44), an electrical impedance so that production of electrical discharges inside the gas inlet pipe (30) is inhibited,

wherein the means (13 to 23) for producing discharge in the discharge space (4) comprise at least one charge storage capacitor (14) which is electrically connected, by means of a first terminal (15), to the cathode (3, 8) and, by means of a second terminal (16), to a first commutation capacitor terminal (18) of at least one commutation capacitor (19) which is electrically connected to the anode (2) by means of a second commutation capacitor terminal (20) thereof, electrical commutation means being provided between the first and second commutation capacitor terminals (18, 20) of the at least one commutation capacitor (19) and a source of charge voltage being provided between the first and second commutation capacitor terminals (18, 20) of the at least one commutation capacitor (19), and

~~Radiation source according to claim 30, characterised in that~~ wherein a plurality of charge storage capacitors (14) are provided, the cathode (3, 8) comprises an annular portion (8) which is connected to a central portion (6) which is connected to the discharge space (4), and the charge storage capacitors (14)

are distributed around the central portion (6) and are connected, by means of the first terminal (15) thereof, to the annular portion (8) and, by means of the second terminal (16) thereof, to a conductor ring (13) which is electrically connected to the first commutation capacitor terminal (18) of the at least one commutation capacitor (19).

35. (currently amended) Radiation source according to claim 20, ~~characterised in that~~ wherein the anode (2) comprises a frustoconical hole (10) for [[the]] passage of the electromagnetic radiation emitted in the discharge space (4), the hole being connected, by means of the small base thereof, to the discharge space (4) and, by means of the large base thereof, towards the outside in order to allow the radiation emitted in the discharge space (4) to pass towards the outside.

36. (currently amended) Radiation source according to claim 20, ~~characterised in that~~ wherein the anode (2) comprises a central cylindrical hole for the passage of the electromagnetic radiation emitted in the discharge space (4), the hole being connected to the discharge space (4) in order to allow the radiation emitted in the discharge space (4) to pass towards the outside.

37. (currently amended) Radiation source according to claim 20, ~~characterised in that~~ wherein the cathode (3, 8) comprises a central frustoconical hole (12) for the passage of gas, the small base of which is connected to the discharge space

(4) and the large base of which is connected to the gas inlet pipe (30).

38. (currently amended) Radiation source according to claim 20, ~~characterised in that~~ wherein the cathode (3, 8) comprises a central cylindrical hole for the passage of gas, which hole is connected, at one side, to the discharge space (4) and, at the other side, to the gas inlet pipe (30).

39. (new) Radiation source according to claim 20, wherein the gas supply line (43) is wound helically around the gas inlet pipe (30) in one plane that is generally perpendicular to an axis of the gas inlet pipe, the second portion being radially exterior and the first portion being radially interior in the one plane.

40. (new) Radiation source comprising:

an anode (2);

a cathode (3, 8);

a discharge space (4) for electrical discharge between the anode (2) and the cathode (3);

a gas inlet pipe (30) for introducing gas into the discharge space (4), the gas inlet pipe (30) being electrically connected to one of the anode (2) and the cathode (3, 8);

means (13 to 23) for producing, in the gas provided in the discharge space (4), an electrical discharge which brings about emission of radiation towards outside the discharge space; and

a gas supply line (43) wound helically around the gas inlet pipe (30) in one plane that is generally perpendicular to an axis of the gas inlet pipe, the gas supply line having a radially interior portion (42) connected to the gas inlet pipe (30) and a radially exterior portion (44) that is connected to a fixed potential, so that production of electrical discharges inside the gas inlet pipe (30) is inhibited.